

REMARKS

Claims 1-23 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

RESTRICTION

The Examiner has required a restriction as follows:

Species A, the method of manufacturing a frangible slug having a composition that consists essentially of 35% ferrotungsten, 3% lubricant, the balance iron and inevitable impurities (claims 1 and 18);

Species B, the method of manufacturing a frangible slug having a composition that consists essentially of metallic powder and lubricant, wherein the metallic powder is oxide-reduced iron (claim 20).

The Examiner then indicates that claim 16 appears to be generic.

Applicants hereby provisionally elect Species A with traverse. Applicants, however, note that MPEP Section 803 states if the search and examination of all the claims in an application can be made without serious burden, the examiner should examine them on the merits, even though they include claims to independent or distinct inventions. In the present situation, Applicants respectfully submit that examining all the claims and Species A and B will not pose an undue burden upon the Examiner, especially since the Examiner has already examined claims 1-22 and rejected the same in this Office action.

If the Examiner reaffirms this Restriction, Applicants hereby elect claims 1-15, 18, and new claim 23. Claims 1-15 and 23 all read on Species A. If the Examiner does reconsider this Restriction for the reason mentioned above, it is believed that all pending claims 1-23 should be examined.

REJECTION UNDER 35 U.S.C. § 112

Claims 4-6, 12 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

In an effort to expedite prosecution, Applicants have made minor amendments to claims 4 and 12 to simply overcome the rejections of the claims under 35 U.S.C. § 112. The amendments to claims 4 and 12 contained herein are of equivalent scope as originally filed and, thus, are not narrowing amendments.

More specifically, claim 12 has been amended to change “theol” to “the tool”, thereby correct a typographical error. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the Section 112 rejections of claims 4 and 12.

With respect to claims 4-6, the Patent Office contends that the phrase “effective to increase the density of the slug to 30 percent ferrotungsten” renders claim 4 indefinite. Specifically, the Office action at page 4 states “the limitation, effective to increase the density of the slug to 30 percent ferrotungsten is not understood because the composition has already been claimed as consisting essentially of up to 35 percent ferrotungsten in claim 1. Is the applicant attempting to claim the slug as consisting essentially of 30 percent ferrotungsten?”

Applicant respectfully disagrees, and notes that the application as originally filed provides sufficient information to enable one having ordinary skill in the art to readily understand the meaning of claim 4. This notwithstanding, Applicants have amended claim 4 in an effort to expedite prosecution. Accordingly, Applicants respectfully request reconsideration and withdrawal of the Section 112 rejections of claim 4.

REJECTION UNDER 35 U.S.C. § 102

Claims 16, 21, and 22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Mravic et al* (U.S. Pat. No. 5,399,187). This rejection is respectfully traversed.

At the outset, Applicants submit that the claim amendments have rendered moot the rejection of independent claim 16 (and all dependent claims therefrom). Claim 16 has been amended to clarify that the frangible slug is effective to impart kinetic energy

to deform a target. Claim 16 is believed to be allowable because the cited patents do not at least disclose, teach, or suggest methods relating to the manufacture of a frangible slug effective at imparting a portion of its kinetic energy to a target for deforming that target.

In addition, various aspects of the present disclosure relate to methods of manufacturing frangible slugs intended to be fired from industrial ballistic tools. The frangible slugs are intended to impart at least a portion of their kinetic energy to a target such as, for example, to knock off or remove clinkers from the inside of a cement kiln and/or to remove carbon or clay plugs from electric furnaces. See, for example, paragraphs [0013] and [0050] of Applicants' application as published under no. US 2004/0200340.

To this end, independent claim 16 recites a method for manufacturing a frangible slug for firing from an industrial ballistic tool, comprising the steps of providing a mixture having a composition that consists essentially of metallic powder and lubricant; compacting the mixture thereby forming a compact; and sintering the compact at a temperature no greater than 900°C to form the frangible slug, wherein the frangible slug is effective to impart kinetic energy to deform a target.

Applicants' review of *Mravic* reveals that *Mravic* does not disclose, teach, or suggest such a method as recited in claim 16 for manufacturing a frangible slug for firing from industrial ballistic tool that is effective to impart kinetic energy to deform a target. Instead, *Mravic* discloses lead-free bullets useful for target indoor shooting ranges and hunting. Applicants have not been able to find any disclosure or suggestion in *Mravic* relating to the manufacture of industrial ammunition or slugs for firing from industrial ballistic tools. Further, *Mravic* discloses that its lead-free bullets should be designed so as to not penetrate or damage the normal steel backstops at target shooting ranges. *Mravic* then explains that the bullets must either (1) deform at stresses lower than those which would be sufficient to penetrate or severely damage the backstop, or (2) fracture into small pieces at low stresses or (3) both deform and fracture at low stress.

Accordingly, *Mravic* does not disclose, teach or suggest methods relating to the manufacture of frangible slugs for firing from industrial ballistic tools, where the frangible

slugs are effective at imparting kinetic energy to deform a target. Because *Mravic* does not disclose each and every feature in claim 16, *Mravic* cannot anticipate claim 16.

With regard to dependent claims 21 and 22, these claims depend from independent base claim 16, which Applicants believe to be allowable in view of the above amendments and remarks. As such, Applicants believe that dependent claims 21 and 22 are also allowable for at least these reasons.

In addition, claims 21 and 22 are further patentably distinguishable over the cited patents in that the cited patents do not disclose, teach or suggest the additional features as required by claims 21 and 22 (in combination with features recited in the independent claim 16 from which they depend).

For example, claim 22 further recites “disposing a sleeve on the slug, said sleeve being formed from a material effective to engage with rifling of the tool and having an inner diameter effective to integrally bond the sleeve to the slug so as to impart spin to the slug when fired from the tool.” The Office action recites to *Mravic* column 5, lines 28-40 in which *Mravic* discloses a jacket or coating for purposes of protecting the gun barrel from damage during firing of the jacketed or coated bullet and preventing gun barrel erosion. Even assuming *arguendo* that *Mravic*’s jacket or coating inherently engages the rifling of the gun barrel (as suggested by the Office action), claim 22 further recites that the sleeve has an inner diameter effective to integrally bond the sleeve to the slug so as to impart spin to the slug when fired from the tool. The Office action fails to identify any particular portion of *Mravic* (or any other patent) relating to the feature about imparting spin to the slug when fired from the tool. For this reason alone, the 102 rejection to claim 22 should be withdrawn. Alternatively, Applicant respectfully requests the Examiner to provide an indication of where in *Mravic* each and every feature recited in method claim 22 is disclosed in order to allow Applicant to fully address and respond to the rejection of claim 22.

REJECTIONS UNDER 35 U.S.C. § 103

Claim 20

Claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mravic et al* (U.S. Pat. No. 5,399,187). This rejection is respectfully traversed.

Claim 20 depends from independent base claim 16, which Applicants believe to be allowable in view of the above amendments and remarks. As such, Applicants believe that dependent claim 20 is also allowable for at least these reasons.

Claims 1-14, 17, 18, and 19

Claims 1-14, 17, 18, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mravic* et al (U.S. Pat. No. 5,399,187). This rejection is respectfully traversed.

Claim 1 has been amended to clarify that the frangible slug is effective to impart kinetic energy to deform a target. Claim 1 is believed to be allowable because the cited patents do not at least disclose, teach, or suggest methods relating to the manufacture of a frangible slug for firing from industrial ballistic tool that is effective at imparting a portion of its kinetic energy to a target for deforming that target.

As noted above, various aspects of the present disclosure relate to methods of manufacturing frangible slugs intended to be fired from industrial ballistic tools. The frangible slugs are intended to be impart at least a portion of their kinetic energy to a target such as, for example, to knock off or remove clinkers from the inside of a cement kiln and/or to remove carbon or clay plugs from electric furnaces. See, for example, paragraphs [0013] and [0050] of Applicants' application as published under no. US 2004/0200340.

To this end, independent claim 1 recites a method for manufacturing a frangible slug for firing from an industrial ballistic tool comprising providing a mixture of powders having a composition that consists essentially of up to 35 percent ferrotungsten in particulate form, up to 3 percent lubricant, and the balance iron in particulate form and inevitable impurities; compacting the mixture to form a compact; and sintering the compact to form the frangible slug, wherein the frangible slug is effective to impart kinetic energy to deform a target.

Applicants' review of *Mravic* reveals that *Mravic* does not disclose, teach, or suggest such a method as recited in claim 1 for manufacturing a frangible slug for firing from industrial ballistic tool that is effective to impart kinetic energy to deform a target. Instead, *Mravic* discloses lead-free bullets useful for target indoor shooting ranges and

hunting. Applicants have not been able to find any disclosure or suggestion in *Mravic* relating to the manufacture of industrial ammunition or slugs for firing from industrial ballistic tools. Further, *Mravic* discloses that its lead-free bullets should be designed so as to not penetrate or damage the normal steel backstops at target shooting ranges. *Mravic* then explains that the bullets must either (1) deform at stresses lower than those which would be sufficient to penetrate or severely damage the backstop, or (2) fracture into small pieces at low stresses or (3) both deform and fracture at low stress.

Accordingly, *Mravic* does not disclose, teach or suggest methods relating to the manufacture of frangible slugs for firing from industrial ballistic tools, where the frangible slugs are effective at imparting kinetic energy to deform a target. Because *Mravic* does not disclose each and every feature in claim 1, *Mravic* cannot anticipate claim 1.

Claims 1-14 depend from independent base claim 1, which Applicants believe to be allowable in view of the above amendments and remarks. As such, Applicants believe that dependent claims 1-14 are also allowable for at least these reasons.

Claims 17, 18, and 19 depend from independent base claim 16, which Applicants believe to be allowable in view of the above amendments and remarks. As such, Applicants believe that dependent claims 17, 18, and 19 are also allowable for at least these reasons.

Claim 15

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mravic et al* (U.S. Pat. No. 5,399,187) in view of *Lowden et al* (5,760,331) as applied to claim 1 above, and further in view of *Harris et al* (U.S. Pat. No. 6,038,978) or *Dippold et al* (U.S. Pat. No. 5,824,944). This rejection is respectfully traversed.

Claim 15 depends from independent base claim 1, which Applicants believe to be allowable in view of the above amendments and remarks. As such, Applicants believe that dependent claim 15 is also allowable for at least these reasons.

NEW CLAIM 23

Claim 23 is supported by the application as originally filed. Accordingly, no new matter is introduced by the addition of claim 23. Claim 23 is believed to be patentably distinguishable over the cited patents because the cited patents do not disclose each and every feature recited in claim 23.

For example, there does not appear to be any disclosure, suggestion or teaching about imparting a slug with frangibility in either *Harris* (U.S. Patent 6,038,978) or *Dippold* (U.S. Patent 5,824,944). And, as noted above, it does not appear that *Mravic* discloses, teaches, or suggests a method for manufacturing a frangible slug for firing from industrial ballistic tool that is effective to impart kinetic energy to deform a target. Instead, *Mravic* discloses lead-free bullets useful for target indoor shooting ranges and hunting. Applicants have not been able to find any disclosure or suggestion in *Mravic* relating to the manufacture of industrial ammunition or slugs for firing from industrial ballistic tools. Further, *Mravic* discloses that its lead-free bullets should be designed so as to not penetrate or damage the normal steel backstops at target shooting ranges. *Mravic* then explains that the bullets must either (1) deform at stresses lower than those which would be sufficient to penetrate or severely damage the backstop, or (2) fracture into small pieces at low stresses or (3) both deform and fracture at low stress.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (314) 726-7502.

Applicants believe that the appropriate fees have been included with this filing. If, however, Applicants owe any additional fee(s), the Commissioner is hereby authorized to charge the fee(s) to Deposit Account No. **08-0750**. In addition, if there is ever any

other fee deficiency or overpayment under 37 C.F.R. §1.16 or 1.17 in connection with this patent application, the Commissioner is hereby authorized to charge such deficiency or overpayment to Deposit Account No. **08-0750**.

Respectfully submitted,

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